

REMARKS

Claims 56-83 are pending in the application.

The drawings are objected to for failing to show the middle dielectric layer recited in claims 58 and 77. Without admitting to the propriety of the objection, Applicant includes herewith replacement sheet 2/2 of the drawings including added Fig. 8. Appropriate amendments are made to pages 4 and 20 of the specification as described herein relevant to the addition of Fig. 8. The subject matter of added Fig. 8 is supported at least by paragraph [0046] of the originally-filed specification and does not constitute new matter. Applicant requests withdrawal of the drawing objection in the next Office Action.

Claims 56-83 stand rejected for obviousness-type double patenting over claims 1-21 of U.S. Patent No. 6,639,267. Included herewith is a timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) to overcome the double patenting rejection. The terminal disclaimer states that the conflicting patent is commonly owned with the present application. Applicant requests withdrawal of the double-patenting rejection in the next Office Action.

Claims 56, 57, 61, 73, and 79 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kammerdiner. Applicant requests reconsideration.

Claim 56 sets forth a semiconductor device that includes, among other features, an inner dielectric layer including an oxidized alloy of at least two metals in a perovskite-type crystalline structure and an outer dielectric layer over the inner dielectric layer. The outer dielectric layer includes an oxide of a selected material, such selected material being generally passivated against carbon and nitrogen reaction. Page 3 of

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the Office Action alleges that Kammerdiner discloses each and every limitation of claim 56. Applicant traverses.

Claim 56 sets forth that the inner dielectric layer includes an alloy with a perovskite-type crystalline structure. Page 3 of the Office Action alleges that the layer of conducting oxide 20(a) of Kammerdiner discloses the claimed inner dielectric layer since column 3, line 1 states that conducting oxide layer 20(a) could be "some of the conducting perovskites." Applicant notes that claim 56 expressly sets forth that the inner dielectric layer is a dielectric. Conducting oxide layer 20(a) of Kammerdiner is clearly not a dielectric regardless of whether it contains "conducting perovskites." Column 3, lines 20-23 of Kammerdiner expressly requires conducting oxide layer 20(a) to be conductive.

Pursuant to column 3, lines 2-5 of Kammerdiner, ferroelectric material 30 constitutes the only dielectric of the capacitor structure shown in Fig. 1. Conducting oxide layer 20(a) merely serves as "the glue layer," as described in column 3, lines 18-20. Applicant notes that paragraphs 16 and 17 of the present specification state that perovskite-type materials exhibit a wide range of physical properties and are of use in a variety of applications. One of the possible applications is as a dielectric, as set forth in claim 56. Kammerdiner does not disclose or suggest use of an oxidized alloy with a perovskite-type crystalline structure as a dielectric layer. At least for such reasons, Kammerdiner fails to disclose each and every limitation of claim 56.

Page 3 of the Office Action further alleges that the claim limitation of claim 56 setting forth that the selected material is "generally passivated against carbon and nitrogen reaction" is a functional recitation not entitled to patentable weight. Applicant asserts that the alleged functional recitation clearly constitutes a description of the

physical properties of the outer dielectric layer. "Being generally passivated against carbon and nitrogen reaction" describes a physical property and, thus, constitutes a structural feature. "Being generally passivated" constitutes a feature that is just as structural as stating that the outer layer of claim 56 is a dielectric, that the outer layer of claim 56 is an oxide, that the material of claim 59 includes amorphous silicon, aluminum, or alloys thereof, or that the inner dielectric layer of claim 56 includes a perovskite-type crystalline structure. None of the listed limitations, or any other limitations of claim 56, constitutes functional recitations. As such, every limitation of claim 56 is entitled to be given patentable weight and Applicant requests action to such effect in the next Office Action.

Applicant further asserts that Kammerdiner fails to disclose an outer dielectric layer including an oxide of a selected material that is generally passivated against carbon and nitrogen reaction, as set forth in claim 56. Thus, Kammerdiner further fails to disclose every limitation of claim 56.

Claims 57 and 61 depend from claim 56 and are not anticipated at least for such reason as well as for the additional limitations of such claims not disclosed. For example, page 3 of the Office Action alleges that claim 61 also sets forth a functional recitation that at least two of the metals exhibit a substantial difference in chemical affinity for oxygen. Such limitation of claim 61 also clearly constitutes a description of the physical properties of the at least two metals in the oxidized alloy of claim 56. It is no different in a determination of functional or structural effect to state that the metals exhibit a substantial difference in chemical affinity for oxygen than it is to state that they exhibit certain melting points, have a particular composition, or exhibit some other

physical property. Accordingly, claim 61 is entitled to be given patentable weight and Kammerdiner fails to disclose the subject matter of claim 61.

Claim 73 sets forth an integrated circuit component that includes, among other features, an inner dielectric layer including an oxidized alloy of at least two metals in a perovskite-type crystalline structure and at least two of the metals exhibiting a substantial difference in chemical affinity for oxygen and a passivation layer over the inner dielectric layer. The passivation layer exhibits passivation against carbon and nitrogen reaction in the inner dielectric layer. As may be appreciated from the discussion above regarding the deficiencies of Kammerdiner as applied to claim 56, such reference fails to disclose every limitation of claim 73. Also, as discussed above regarding the structural nature of every limitation in claims 56 and 61, every limitation of claim 73 is structural and is entitled to be given patentable weight. Thus, Kammerdiner does not anticipate claim 73. Claim 79 depends from claim 73 and is not anticipated at least for such reason as well as for the additional limitations of such claim not disclosed.

As established herein, Kammerdiner fails to anticipate claims 56, 57, 61, 73, and 79 and Applicant requests allowance of such claims in the next Office Action.

Claims 59, 60, 65-69, 74, 78, and 80 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kammerdiner. Applicant requests reconsideration.

Claims 59 and 60 depend from claim 56, the subject matter of which is described above. As established, Kammerdiner fails to disclose every limitation of claim 56 and claims 59 and 60 are thus patentable at least for such reason. Additionally, page 4 of the Office Action acknowledges that Kammerdiner fails to disclose that the material of the outer dielectric layer includes amorphous silicon, aluminum, or alloys thereof. Page

4 of the Office Action alleges it would be obvious to select the claimed components for the material since the Applicant's disclosure states that the outer dielectric layer can include lead and titanium and Kammerdiner allegedly describes ferroelectric material 30 as including lead zirconate titanate (PZT).

Applicant acknowledges that the limitations of claim 59 leave the material open to including lead, zirconium, and/or titanium, among other elements. However, the express terms of claim 59 require the presence of amorphous silicon, aluminum, or alloys of amorphous silicon and aluminum. It is thus irrelevant that Kammerdiner describes ferroelectric material 30 as including PZT since no suggestion or motivation exists in the prior art to include amorphous silicon, aluminum, or alloys of amorphous silicon and aluminum in the Kammerdiner PZT. Kammerdiner fails to appreciate any advantage to providing an oxide of a selected material being generally passivated against carbon and nitrogen reaction, as set forth in claim 56 from which claim 59 depends. Accordingly, Kammerdiner cannot be considered to appreciate any advantage to providing amorphous silicon, aluminum, or alloys thereof in the material. No other suggestion or motivation exists or is alleged in the Office Action to exist for including amorphous silicon, aluminum, or alloys thereof in the PZT of Kammerdiner's ferroelectric material 30. At least for such reason, Kammerdiner fails to disclose or suggest every limitation of claim 59.

Claim 65 sets forth a semiconductor device that includes, among other features, an inner dielectric layer including an oxidized alloy of at least two metals in a perovskite-type crystalline structure and at least two of the metals exhibiting a substantial difference in chemical affinity for oxygen and an outer dielectric layer on and in contact with the inner dielectric layer. The outer dielectric layer includes an oxide of a material

including amorphous silicon, aluminum, or alloys thereof and the material exhibits passivation against carbon and nitrogen reaction. As may be appreciated from the discussion above regarding the deficiencies of Kammerdiner as applied to claims 56, 59, and 61, Kammerdiner fails to disclose or suggest every limitation of claim 65. Claims 66-69 depend from claim 65 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested.

Claims 74, 78, and 80 depend from claim 73, the subject matter of which is discussed above. Kammerdiner fails to disclose or suggest every limitation of claim 73 and claims 74, 78, and 80 are thus patentable at least for such reason as well for the additional limitations of such claims not disclosed or suggested. For example, claim 74 sets forth that the integrated circuit component of claim 73 comprises dynamic random access memory (DRAM). Page 5 of the Office Action alleges that the subject matter of claim 74 does not differentiate the claimed apparatus from the Kammerdiner apparatus as merely constituting a different manner in which the claimed apparatus is intended to be employed. The Office Action relies upon Ex Parte Masham, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987), as allegedly supporting the Office's finding. Applicant traverses both the Office's finding that the difference between the claimed apparatus and Kammerdiner merely constitutes a different manner of employing the apparatus and the reliance upon Ex Parte Masham as allegedly supporting the Office's position.

Page 5 of the Office Action references both the DRAM limitation of claim 74 as well as the non-volatile field effect transistor (FET) memory limitation of claim 75. Accordingly, Applicant presumes that the rejection on page 5 applies to both of claims 74 and 75. Applicant asserts that the claim 74 limitation that the integrated circuit component of claim 73 comprises DRAM does not constitute a mere statement of how

the component is intended to be employed. Instead, claim 74 clearly constitutes a further structural limitation.

As readily known by those of ordinary skill, the structural features of an integrated circuit component determine whether it is DRAM, some other type of memory, or some other type of component. Even though the integrated circuit component of claim 73 might be employed in a variety of manners, the statement in claim 74 that the component comprises DRAM essentially replaces the preamble term “integrated circuit component” with “DRAM.” Similarly, claim 75 replaces the preamble term “integrated circuit component” with “non-volatile FET memory.” Claims 74 and 75 further define the integrated circuit component in claim 73 as being a particular type of component, namely, DRAM or non-volatile FET memory. Accordingly, the further structural limitations of claims 74 and 75 do not merely set forth an intention of how the claim 73 component is to be employed. To the extent that “DRAM” and “non-volatile FET memory” imply any inherent, associated structural features that form a part of such type of component, such structural features are added by claims 74 and 75.

Ex Parte Masham clearly supports the Applicant’s position described above and fails to support the Office’s position alleged on page 5 of the Office Action. The claimed apparatus in Ex Parte Masham included “an apparatus for mixing flowing developer material” where the mixing means was “completely submerged in the developer material.” Id. at 1648. In comparing the claimed apparatus to the cited art, Ex Parte Masham found that the only difference between the claimed apparatus and the prior art apparatus was that the prior art apparatus only depicted the mixing means as being partially submerged in the developer material. Id. Accordingly, Ex Parte Masham found that “the recitation ‘completely submerged in the developer material’ does not

impose any structural limitation upon the claimed apparatus which differentiates it" from the prior art. In other words, the limitation stating that the mixing means is completely submerged during use, does not imply any additional structural limitations.

The limitation in claims 74 or 75 that the integrated circuit component comprises DRAM or non-volatile FET memory must be considered at least to imply additional structural limitations. Such claims present quite a different circumstance from that to which the holding of Ex Parte Masham applies. Thus, Ex Parte Masham can be clearly distinguished from and does not apply to the circumstance of claims 74 and 75 that recite additional structural limitations instead of mere intention for employing the claim 73 apparatus. At least for the reasons indicated herein, Kammerdiner fails to disclose or suggest the additional structural limitations set forth in claims 74 and 75.

As established herein, claims 59, 60, 65-69, 74, 78, and 80 are patentable over Kammerdiner and Applicant requests allowance of such claims in the next Office Action.

Claims 58, 62-64, 70-72, 77, and 81-83 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kammerdiner in view of Miyashita. Applicant requests reconsideration.


Claims 58 and 62-64 depend from claim 56 the subject matter of which is discussed above. Claims 70-72 depend from claim 65 the subject matter of which is discussed above. Claims 77 and 81-83 depend from claim 73 the subject matter of which is discussed above. Kammerdiner fails to disclose or suggest every limitation of claims 56, 65, or 73 and Miyashita does not disclose or suggest and is not alleged in the Office Action to disclose or suggest such deficiencies of Kammerdiner as discussed herein with regard to claims 56, 65, or 73. Combination of references cannot be

considered to disclose or suggest subject matter that is absent from both. Accordingly, claims 58, 62-64, 70-72, 77, and 81-83 are patentable over the cited combination at least for their dependence from claims 56, 65, or 73 as well as for the additional limitations of such claims not disclosed or suggested.

Applicant herein establishes adequate reasons supporting patentability of claims 56-83 and requests allowance of such claims in the next Office Action.

Respectfully submitted,

Dated: 10 Dec 2004

By: 
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In the Drawings

Please enter the enclosed replacement sheet for sheet 2/2 in the above-referenced application. The replacement sheet adds new Fig. 8. Acknowledgement of receipt of the replacement sheet and its acceptance into the file is requested.

Enclosure: Sheet 1/2 and Replacement sheet 2/2